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ABSTRACT

The key findings of a survey of 20 further education (FE) colleges in England and Wales that were actively engaged in developing their information technology (IT) expertise and resources show that: (1) many teachers do not appreciate the relevance of the computer to their work; (2) few colleges have an effective and structured approach to IT in terms of staffing, equipment, or application; and (3) the lack of relevant software is a significant constraint on IT development. Topics covered in this report on the survey include definitions of IT; college policies; the role of local education agencies (LEAs); sources of income; academic and support staffing; facilities; software development; the use of IT by departments; non-academic use of IT; the effect of the introduction of IT on the design of mainstream curriculums; staff development; and college plans for future development. The appendices include a description of the research methodology, a table depicting use of IT by department, a list of typical courses in IT, examples of IT development and applications, and definitions of acronyms used in the report. (DJR)

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INFORMATION TECHNOLOGY IN FE

AN OCCASIONAL PAPER

April 1984

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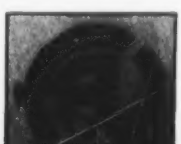

FURTHER EDUCATION UNIT

Elizabeth House York Road London SE1 7PH Telephone 01-928-9222 ext

Chairman J G Owen CBE

Chief Officer Jack Mansell MEd CEng FIEE MIMech E

Chief Education Officers
Principals of FHE Establishments
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Dear Sir/Madam

INFORMATION TECHNOLOGY IN FE

Enclosed is a state of the art survey of IT in some twenty colleges. As the Preface points out, the accelerating nature of the technology itself and the relatively small sample makes it more like a snapshot, but the picture emerging "has a disturbing reality".

After the Introduction, Section 2 of the document explores some of the definitions that exist. Subsequent sections describe a range of college policies, the role of the LEAs, income, staffing and accommodation issues. As might be expected, policies and practices are found to be in various stages of development, and some are more restrictive than others.

Within colleges, departmental awareness and therefore provision of IT courses, varies, and there appears to be a threshold of awareness necessary to exceed before curriculum development becomes a reality. The need to provide IT for YTS was, at the time of the survey at least, deemed to have had a greater impact than had the major FE examining bodies on mainstream courses.

Not surprisingly therefore, the survey generally appears to conclude that the overall provision is patchy, and increased resources and staff development are obviously required.

As an immediate aid to development, Appendix D describes some examples of good practice that were found in the survey. These range from departmental initiatives across a range of disciplines, to the use of IT in college support functions.

The FEU has an increasing portfolio of work in Information Technology, aimed at assisting colleges and LEAs in formulating policy and developing curriculum. This short document is part of that portfolio and whilst not uncritical in its findings, it could be a useful aid to articulating needs in this area.

Yours faithfully

Jack Mansell

JACK MANSELL
Chief Officer

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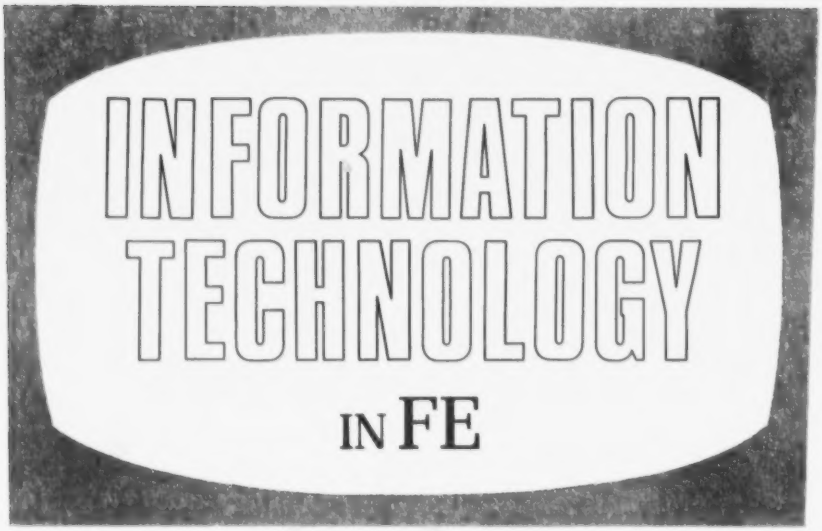

A survey of IT policy and of current practice in a sample of colleges.

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INFORMATION TECHNOLOGY *is an area that is developing at a rate which ensures that any publication is, almost by definition, out of date. This 'snapshot' of the current state of the art of IT in about twenty colleges can be no exception. However, some of the conclusions highlight problems that are unlikely to disappear overnight and publication is desirable.*

There is increasingly an awareness that the microprocessor and its associated technology will impinge upon all aspects of society. Further education is no exception to this. With respect to curriculum, teaching strategy, support services and college management, no FE department or teacher can remain immune from the requirement to come to terms with the demands of IT. In **Computer literacy*** *we have pointed out that competence in interacting with a computer must be regarded as a* **basic skill,** *and that all teachers have a responsibility to contribute to students' acquisition of this skill. One of the messages of this survey is that many teachers are not ready for the computer and do not indeed see its relevance to their work. There is obviously a need for staff development activity in this area, ranging from awareness raising to the specific updating of skills.*

Whilst the sample of colleges surveyed is too small to be regarded as truly representative, the picture emerging has a disturbing reality. Even among colleges with go-ahead departments possessing relatively advanced facilities, effective and structured college and/or LEA policy appears to be largely lacking in the IT area. It is hoped that this survey will provoke thought and discussion on this point. The case studies in **Appendix D** *indicate that a considerable amount can be done, even when resources are strictly limited.*

*The survey appears to show that a major practical constraint affecting the development of IT in the colleges is the paucity of suitable software and that the lack of effective coordination is causing many individuals to unnecessarily duplicate the work of others. Some re-inventing of the wheel by enthusiasts as an essential part of their staff development is to be applauded; but for those who are unaware or nervous of the potential of IT in their area, the availability of software is an essential pre-requisite for action. The FEU is active in this area (as are a number of other agencies) and we hope soon to publish more information. In the meantime, with FEU support an advisory service for the teaching of computer aided engineering in further education has been set up at the City of Birmingham Polytechnic**. But, as the survey implies, there is a need for a major national investment in the provision and coordination of software support for further education.*

Apart from the issues described above the survey makes the obvious point that FE, unlike the schools sector, has not enjoyed an MEP programme. Compared to this any FEU support must be marginal. It would be easy to construct a deficiency model as a basis for future action but (as the appendices show) progress is being made and a more positive programme should be possible, based on good practices. We have already started work on staff development and before long we hope to publish a short statement indicating how we aim to help colleges and LEA's implement a self-help development programme in IT. Obviously, the formulation of a policy including a college-wide computer literacy programme is a good start.

Finally the FEU would like to place on record its appreciation of the task carried out by Mr Philip R Smith (recently retired HMI) in producing the data on which this report is based. Our appreciation is also due to the colleges and other organisations which so willingly co-operated in this project.

*Computer literacy (FEU) November 1983

**See FEU Research Project 90

INTRODUCTION

1. ***Information Technology (IT)*** encompasses a range of 'new' technologies and their applications which are already making a profound impact upon our society and our way of life. There is an increasing demand and need for instant access to knowledge and information of all sorts to enable today's world to function effectively.

2. In Britain, Government support has been forthcoming for IT developments in industry through the Department of Industry's *Support for Innovation* programme, which has provided grants and advisory services covering a wide variety of new technologies. Schools also have benefited through the *Microcomputers in Schools* scheme and the *Microelectronics Education Programme* providing equipment and staff training.

3. It is now widely recognised that IT represents a major growth area in education and training. The *Manpower Services Commission* has identified an introduction to computer literacy/information technology as one of the core areas in the *Youth Training Scheme*, and pressure from industry and other sources is leading to an increased demand for IT to be provided as a significant part of the FE curriculum. FEU has already sponsored a substantial project in computer literacy *, and this project surveys the state of the art in IT within FE colleges. The report which follows is based on information gained on visits to a sample of 20 colleges during 1983. A brief description of the methods used in choosing the sample and collecting the data appears in ***Appendix A.*** It is hoped that even this small sample demonstrates the scale and complexity of the problem facing further education if it is to adequately meet the demands of industry and commerce, upgrade the skills of its existing students and build on the work already under way in the schools sector.

**Computer literacy Part 1: a manager's guide* (FEU) 1983

**Computer literacy Part 2: a teacher's guide* (FEU) 1983

INFORMATION TECHNOLOGY – THE PROBLEM OF DEFINITION.

4. A number of definitions of *Information Technology* have been attempted in recent years, with varying degrees of success, most referring to the relationship between computer technology, communications technology and the storage, processing, transmission and retrieval of information. Three such definitions appear below.

5. For this study we have accepted that colleges define *Information Technology* as they perceive it. This has imparted a certain flavour to the information gained, which itself might be considered indicative of the state of the art of *Information Technology* in the colleges surveyed.

6. The working definition adopted by the research was:

A. *All items of electrical and electronic equipment which incorporate microprocessors or transistors, and items of equipment which operate in conjunction with them but independently. Thus,* **microprocessors, microcomputers, wordprocessors,** *are included in the definition, as is all equipment peripheral to these devices (such as* **printers, disc drives, automatic typewriters** *etc).*

B. *The academic discipline concerned with the study of the application and development of these devices and of the underlying principles involved in their use.*

7. For the sake of brevity, *Information Technology* will be referred to in the remainder of this report as ***IT*** (A full glossary of terms used appears in ***Appendix E.***)

CGLI:

'Information Technology is concerned with systems for the creation, acquisition, processing, storage, retrieval, selection, transformation, dissemination and use of vocal, pictorial, textural and numerical information. Current systems typically utilize a microelectronics-based combination of computing and telecommunications which may, in turn, act in conjunction with other technologies to multiply their effects.' (*CGLI National Advisory Committee for IT. June 1983.*)

UNESCO:

Information Technology is 'The scientific, technological and engineering disciplines and the management of techniques used in information handling and processing; their applications; computers and their interaction with men and machines; and associated social, economic and cultural matters.'

ERGONOMICS UNIT, UNIVERSITY COLLEGE, LONDON:

Information Technology is 'The production, transformation, storage and transmission by electronic means of information in the form of representations'. (*Information Technology: a 'core' for YTS*, Report to MSC, April 1983).

COLLEGE DEVELOPMENT POLICIES RELATING TO INFORMATION TECHNOLOGY.

8. All the colleges surveyed indicated that they had a policy of introducing IT into all courses, but there was great variation in the level of priority accorded to it. It was seldom clearly defined, and sometimes there was no real recognition of the need for exceptional effort in this field. Indeed five of the colleges visited appeared to have no central plan or policy of development.

9. Nevertheless, it is not easy to build up adequate resources of IT quickly in any educational institution, and in general the colleges surveyed had made a fair response to the recent Government initiatives stimulating interest in the subject. Some for example had benefited from schemes sponsored by the Department of Industry, and all had received a general boost to development and awareness as a result of Information Technology Year (1982). It is still costly to provide IT equipment on the scale required by a typical college (although its price is falling rapidly) and it is difficult to find staff with sufficient expertise to make good use of it. In general, the colleges were willing to invest as heavily as possible in equipping departments of *Engineering, Science, Business Studies* and *Office Studies*, while the other departments were largely neglected. This lopsided development appeared often to be due to unconscious policy decisions (eg in some non-user departments few of the staff knew anything of IT, and it sometimes happened that there was no one in authority in the college with sufficient knowledge of their requirements to be able to point the way forward). Hence the policy adopted was often one of encouraging strength and ignoring weakness, and indeed such a policy would seem likely to have satisfied the governing bodies and the LEA's who provided much of the funds.

10. ***Appendix B*** clearly reveals this situation. There were 150 departments in the 20 colleges visited: 80 of them were concerned with the disciplines listed above and of this 80 all but 4 had an involvement in IT. By contrast only half of the remainder made any use of IT and most of these only to a limited extent.

11. College policy was always related to the needs of the individual college. The idea that colleges should cooperate with each other and develop centres of excellence in particular fields of activity was seldom considered, and only one college had any plans to work with its neighbours in this way. There was no noticeable initiative by LEA's in this respect.

12. Whatever the policy of a college for the development of IT, an essential requirement for successful progress is good leadership – and the most important influence in this survey appeared to be the attitude of the Vice-Principal.

13. If he/she was an enthusiast, IT prospered: if not, then IT grew sporadically in uncoordinated clusters of activity in the main user departments. In one college, for example, the Vice-Principal was appointed as HOD Science. He was promoted a year later and immediately initiated an intensive programme of staff development in IT using trained staff borrowed from his previous college to teach on in-service courses. From this modest beginning he had, within three years, built up a powerful centre of expertise in IT in the college and had devoted all available funds to increasing the stock of IT equipment.

14. It appeared to be of no great consequence if the Vice-Principal had himself no technical expertise in IT. If he was an ex-HOD Computer Science (as was sometimes the case) so much the better, but the prime need seemed to be for drive and determination among senior staff to get IT well established.

15. The college Academic Board was usually responsible, at least nominally, for the control of development of IT in the colleges surveyed and was advised by one of its sub-committees, typically the *Computer Committee*. This committee seldom had any executive function, but it served as a forum for the exchange of ideas, and made appropriate recommendations to the Academic Board.

16. The relationship between the Academic Board and the *Computer Committee* was not always clearly defined, and in some colleges there was no *Computer Committee* or its equivalent at all.

17. In general *Computer Committees* met infrequently and did not appear to have sufficient standing in the college to influence policy. The main thrust of development seemed to depend on the energy and determination of the senior staff of the college who acted in consultation with the Academic Board.

4 THE ROLE OF THE LOCAL AUTHORITIES IN THE DEVELOPMENT OF INFORMATION TECHNOLOGY.

18. Several of the colleges surveyed received enthusiastic and generous support from their LEA's in developing IT, but others were not so fortunate.

19. Some LEA's did not appear to recognise that the need was urgent, and gave no special consideration to requests for additional equipment. Few allowed their colleges to retain all the fees earned from short courses: some only a part of them, and some none at all.

20. At a time of cuts in public expenditure this range of support was not perhaps surprising. Where the LEA was generous the effect could be far reaching. One large college, for example, owed much of its IT development to its income from short courses which its LEA had allowed it to retain.

21. Some LEA's appeared to exert considerable control in matters of expenditure which their colleges incurred. One, for example, insisted that its County Treasurer and its County Computer Manager should both approve the purchase of all items of IT equipment which its colleges proposed. Another had decided the exact type and make of computer to be supplied to a college. Others tried to ensure that their colleges bought equipment made be a particular manufacturer, presumably so that better terms could be obtained.

22. Difficulties of this nature were often caused by a lack of understanding and a failure of communication between the two parties. Some LEA's surveyed appeared to lack the technical competence to assess the case put forward, and colleges were sometimes not sufficiently adept in explaining clearly and simply what was needed.

SOURCES OF INCOME FOR THE PURCHASE OF IT EQUIPMENT.

23. The LEA's provided most of the funds for the purchase of capital equipment but (as noted above) the quality of provision and the support which they gave varied considerably. In a period of rapid technological change it is natural that colleges should wish to expand their resources rapidly, and those surveyed often actively sought other sources of income.

24. From time to time Government Departments have made modest funds available for the development of IT, and some colleges have been quick to seize these opportunities. Thus in the late 1970's the Department of Industry initiated the *Microprocessor Applications Project*, (known as the *MAP* scheme) which provided funds for the training of college staff in the applications of microprocessors. Several colleges in the survey had benefited considerably from this scheme, and for one it resulted in a realignment of its educational aims and a much greater involvement with local industry.

25. More recently the DOI *Microcomputers in Schools* scheme and the *Microelectronics Education Programme* (the *MEP* scheme) have provided welcome funds for the purchase of microcomputing facilities, but almost exclusively in schools. The success of this scheme in the schools had caused some of the colleges surveyed some embarrassment. Some of the school leavers who came to these colleges as students were very knowledgeable about many aspects of IT and the colleges were concerned because they had barely adequate resources of equipment with which to teach them.

26. The *Manpower Services Commission* was another important source of income for the colleges. It provides the funding for a wide variety of training courses for young people under the *Youth Training Scheme* (and its predecessors), and for those wishing to change their careers under the *Training Opportunities Scheme*. The colleges provided the educational backing for these courses and received payment for it. Some LEA's allowed their colleges to retain all or part of this income, and many developments in IT had been funded by this means, although the MSC specifically exclude the use of these funds for the purchase of hardware. The *National Computing Centre* also provided funds for certain projects in IT.

27. Some colleges had increased their income significantly by offering short courses in various aspects of IT to local industry: such courses were usually of about 30 hours' duration and were offered on a part-time basis spread over 10 weeks. Short full-time courses lasting 1-3 days were also offered, and sometimes college lecturers went to local firms for a few days to give an in-service course, taking the appropriate equipment with them.

IT EQUIPMENT IN THE COLLEGES.

28 During the late 1960's and most of the 1970's the *mainframe computer* was a coverted status symbol in the world of further education. Large, cumbersome and of limited capability as it was, it did represent to colleges a significant advance on the facilities which they had at that time and many were convinced that they could not progress without one. Only a few were able to persuade their LEA's and the Department of Education and Science that they needed one, and nearly all of these eventually became Polytechnics or Colleges of Higher Education.

29 Few of the FE colleges surveyed had a *mainframe computer*, and in general they no longer felt the need to acquire one. Those who had sometimes wished to enhance it and to increase the number of terminals connected to it if this was technically possible, but only one or two colleges saw this type of development as best suited to their needs.

30 Most of the colleges visited were operating on several sites, and in general they considered that in this situation they were better off with a large number of *microcomputers* or *minicomputers*, or a combination of these than with a *mainframe computer*. The disadvantages of a *mainframe computer* were well known to the colleges. Only a limited number of terminals can be connected to it and its capability declines if too many are connected simultaneously, it is bulky and difficult to move, and its wiring is expensive and complicated (often involving rental charges for lines between sites).

31 Among the colleges surveyed it was ususal to have a substantial number of *microcomputers* in the main user department (*microprocessors* were found in the Engineering departments). Other devices which made use of *microprocessors* included *dedicated word processors* (*ie* machines dedicated to word processing which could not be used for any other purpose), *CNC (Computer Numerically Controlled) machine tools* and *robotic arms*.

32 Some colleges also had one or two *minicomputers*, each supporting about six terminals. Some of these were used as *word processors* in the departments of Business Studies or Office Studies, but they could also be used for general computing work.

33 One college had two identical *minicomputers* each with 6-8 terminals. They were supplied by different firms and it had proved impossible to connect them to form a network or to interchange the software supplied with each one because of difficulties concerning copyright.

Academic Staff

34. In all but the smallest FE institutions IT appeared to be the prime concern of two groups of staff whose roles were clearly distinguishable from each other. These groups were the *Computing Section* and the *Computer Unit*. They were not always formally designated by these titles and sometimes in small colleges their two roles were merged, but the essential character of the type of work performed by each was still apparent.

35. In the colleges surveyed the *Computing Section* was usually part of the Science or Engineering Department. The academic staff of the *Section* had a high level of expertise in IT, and nearly always some had degrees in *Computer Science* or equivalent qualifications. A typical *Section* had three of four members of staff teaching computing full time, and several others who made a significant contribution. These *Sections* usually taught computer science and computer studies as academic subjects and sometimes did service work for other departments, but specialized applications of IT were usually taught by the departments concerned.

36. In a number of colleges the *Computer Unit* staff were housed in accommodation known as the *Computer Centre*. If there was a *mainframe computer* this was located in the *Computer Centre* and the *Unit* staff were responsible for it. They were sometimes employed as members of a department for administrative purposes, but in some colleges the *Unit* was an autonomous entity and was responsible directly to the Vice-Principal. It was generally accepted that the *Unit* should provide a service for the whole college; and the staff of the *Unit* usually comprised one or two academic staff and a technician.

37. Most colleges considered that the *Unit* should have an operator to control and operate the mainframe machine, and a programmer to give programming advice to all comers – but all too frequently the academic staff were called upon to do both these tasks in addition to their teaching duties. It was also common to find that these *Units* were housed in unsatisfactory and makeshift accommodation.

38. The *Unit* was generally regarded as the prime source of help and information in all matters concerning IT. It provided advice on the use of equipment and on programming, provided software and appropriate documentation, published periodical bulletins concerning the development of IT in the college, and ran staff development courses in IT for college staff and sometimes school teachers. In addition the *Unit* was normally responsible for the control and maintenance of a wide variety of non specialist IT equipment which was often deployed in teaching laboratories.

39. One college had pursued path of development which was unique within the sample of college surveyed. All the lecturers who taught computing in the college were members of various departments, but they all belonged to a *Computer/ Microprocessor Unit*, which was analogous in structure to a society. They met regularly and frequently at pre-arranged times (generally in the lunch hour) to organise the teaching and development of IT in the college. This provided an effective means of development during a period of transition in which the *Unit* was being developed.

40. These were one or two examples of colleges which had installed IT facilities in the library for student use, including *Prestel*. A few other colleges had plans to install facilities of this sort in the near future.

41. A discernible pattern of IT teaching emerged from the survey. The *Computing Section* taught *Computer Science* and programming as required to all departments; the *departments* taught specialised applications of computing to their own students, and the *Computer Unit* (where it had a separate existence) provided in-service training for college staff and sometimes for teachers from local schools. These distinctions however were not clear cut and there was some overlapping between the activities of the three groups of staff.

Support Staff

42. There were three essential tasks which non-academic staff performed in the computer installations of the colleges surveyed, maintenance, machine operation, and programming.

43. Colleges had always found it difficult to obtain approval for the appointment of such staff, and in recent years the problem had become more acute. Some LEA's were reluctant to appoint technicians and as a result it sometimes happened that academic staff were forced to do work for which they were not properly trained. Most colleges had one technician already in post who had been retrained to undertake the maintenance and repair of IT equipment, but opinions were expressed that there was a shortage of suitable people and that some technicians were too set in their ways to be capable of absorbing new technological ideas.

44. Where there were computer operators in colleges with *mainframe computers* they could also assist users of other IT equipment. In addition in some colleges they gave much practical help in development work.

45. There were few professional programmers in the FE colleges but when they were in post they provided valuable help to both students and staff in all aspects of programming.

46. Most colleges surveyed had insufficient support staff and it was nearly always the case that the academic staff did most of the programming and development work and the technician did everything else.

Accommodation

47. It has been observed above that where *mainframe computers* exist in colleges they are generally housed in a *Computer Centre*. Among the colleges surveyed this usually consisted of one or two converted classrooms, and was nearly always inadequate for the needs of the *Computer Unit* responsible for it.

48. Such *Centres* were rarely purpose built and since negotiations for the acquisition of a college computer were usually protracted, colleges acquiring a mainframe installation for the first time were usually glad enough to have the equipment and tended not to worry unduly about deficiencies in the accommodation available, or shortages of staff. Nevertheless, it was disturbing to find that in one college the two academic staff members of the *Computer Unit* had to share a small room with a very noisy computer which was installed six years previously, and that although a replacement machine had been approved there were still no plans to house and staff it adequately.

49. Colleges which did not have a *Computer Centre* usually had computer laboratories in which there were ranges of *microcomputers* for general use.

50. There were also IT laboratories and workrooms in departments for specialized applications; eg microprocessor laboratories, word processing classrooms, workshops for *CNC* machine tools and robots) etc.

Software Development

51. The colleges generally developed their own software and wrote their own syllabuses for short courses. For standard full-time and part-time courses they had less scope, being constrained by the published examination requirements of the various examination boards and professional bodies.

52. A wide variety of specialized programmes had been produced for teaching purposes, but there seemed to be much duplication of effort since everyone tended to work in isolation for his own college. There were a few exceptions: one or two regional software exchange schemes had been set up and, for example, one college was participating in a scheme to collate exisiting software for catering courses.

53. In general, however there is an urgent need for some national body to coordinate the software development work which is being done in the colleges.

INFORMATION TECHNOLOGY IN THE DEPARTMENTS.

54. In the colleges visited, the departments which were most involved in the use of IT were those of Engineering, Science, Business Studies and Office Studies. Some Departments of Catering were beginning to take a keen interest in the subject and one or two had equipped classrooms with microcomputers for use on their courses. Apart from these, nearly all other departments had only a marginal interest in the subject.

55. Engineering departments were mostly concerned with *microprocessors*, and they did not usually have many *microcomputers*. Their main interests lay in the use of *microprocessors* for the control of equipment and for simulation techniques. Much time was spent on project work concerned with the application of *microprocessors* to particular situations. These was also considerable emphasis on *CNC*, the students being taught the use both of machine tools and of the *microprocessors* which controlled them.

56. One or two colleges had graphics terminals which were used for teaching *Computer Aided Design (CAD)* and *Computer Aided Drafting*, but at the time of the survey there was not much activity in this area of work.

57. There was little development in the field of *Computer Assisted Learning (CAL)* and only one college had a laboratory equipped for this purpose.

58. Many of the colleges visited possessed *robotic arms* and some colleges had sensible plans for courses to instruct students in the control, maintenance and repair of these expensive machines. *Robotic arms* found during the survey were mainly of the 'pick and place' type, sometimes having the ability to reject defective articles or count the total number of articles handled.

59. Nearly all the colleges which taught the use of *robotic arms* and *CNC* machines had full-scale equipment on which to instruct the student. These machines were costly and very large (in one college there were special safety precautions to ensure that no one was hit by a robotic arm).

60. Whether these large machines were installed to familarise the students with their use, or to teach the students to program the microprocessors attached to them, there appeared to be too few of them available, and it is worth considering whether smaller machines could have been used to simulate their use. (Several colleges took this view and had installed small equipment which simulated the processes involved.)

61. In the main, Science Departments taught standard computing courses (eg *GCE O and A level Computer Science, BEC/TEC National Diploma/Certificate in Computer Studies* and *BEC* and *TEC Computing Units)* and these included such subjects as computer appreciation, computer literacy, programming, and some applications of computing as service work for other departments.

62. Business Studies departments taught programming in ***BASIC*** and ***COBOL*** and the elements of data processing to their students, and they also used applications packages. For the most part they used the standard syllabuses of the professional institutions and the *BEC/TEC* programmes, but in one college the accounting syllabuses had been fundamentally revised so that microcomputers were used to teach the principles of accounting.

63. Office Studies departments and Business Studies departments teaching office skills were heavily involved in the teaching of word processing. For this they used *microcomputers* or *minicomputers* with about six terminals. Some departments had developed very sophisticated word processing packages and all the colleges surveyed regarded word processing as an essential part of their secretarial and typing courses.

64. Some Catering departments had recently incorporated the teaching of IT into their courses. The subjects taught included computer literacy, computer appreciation, word processing, simulation of hotel office situations, room reservations, and billing etc., and stock control used in a real time situation in the college restaurant.

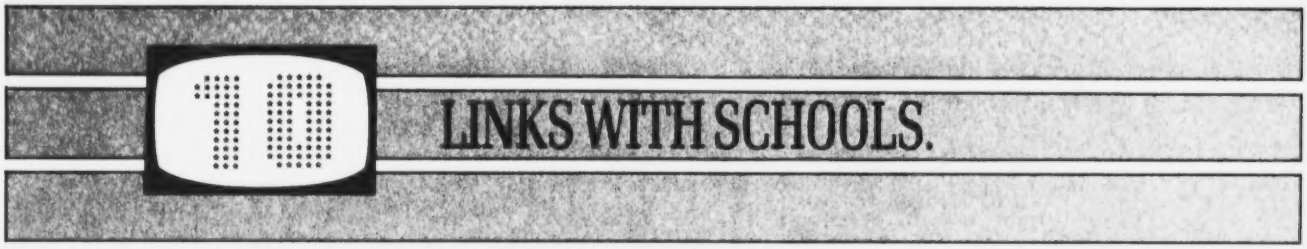
65. There was little activity in departments concerned with other subjects. For the most part that staff in these departments appeared to know little of IT, or of its relevance to their work.

66. A list of some of the IT courses to be found in the colleges surveyed is given in ***Appendix C,*** and some examples of good practice and of unusual applications of IT are given in ***Appendix D.***

67. There were two non-academic uses of IT to be found in the colleges surveyed: college administration and library automation.

68. Several colleges had written successful software packages for college administration and one had sophisticated equipment on which to implement the system which it had devised. Others were less ambitious and had produced simpler programs with more limited applications.

69. Only one college had designed and implemented its own systems of library automation based on a microcomputer. This is an unusual, if not unique, development in FE colleges and details are given in ***Appendix D.***

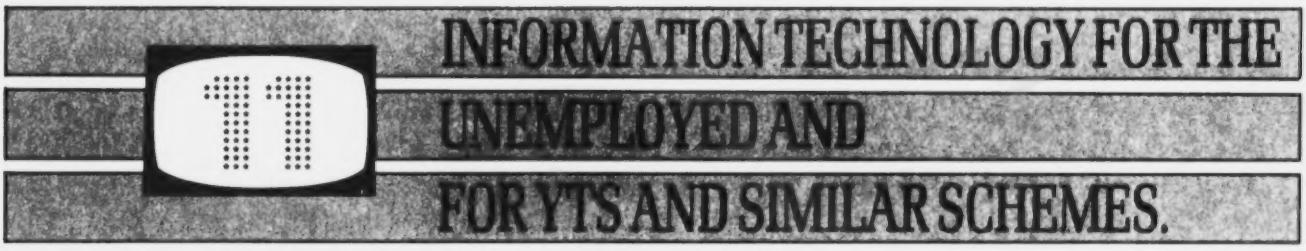


10 LINKS WITH SCHOOLS.

70. Most colleges surveyed were not committed to the provision of a schools computing service. A few provided a substantial amount of in-service training for teachers (200 teachers in one college in 1981-82 and 70 in another in 1982-83) but in general it was difficult for a college to find staff to train teachers and also for the schools to release teachers from their teaching duties to attend the college.

71. A few colleges provided link courses for school pupils in IT subjects and one taught *A level Computer Science* for the local schools, but most colleges did not see themselves as providing IT education for school in the long term. (One college admitted that they did not get on with the LEA schools administration, and so they had nothing to do with schools computing.)

72. There was one exception to this pattern. This was a college which had provided a computing service for schools for the past eight years, at first by batch processing schools programs, and later by a network of 10 terminals connected to a *minicomputer* in the college. There was a *microprocessor centre for schools* (set up by the college) and there were about 60 *microprocessors* in the local schools which were owned and maintained by the college. There were also IT facilities in two schools for maladjusted children. Much of this development was due to the enthusiasm of both the LEA adviser and the college staff.



11 INFORMATION TECHNOLOGY FOR THE UNEMPLOYED AND FOR YTS AND SIMILAR SCHEMES.

73. All colleges surveyed were very much concerned with providing courses for the unemployed and for the *Youth Training Scheme* and two had set up separate departments for this purpose. Both of these provided some training in IT for their students, mostly computer literacy, computer appreciation and some word processing.

74. For the most part however, colleges did not as yet provide a significant amount of training in IT for such students, but several hoped to start suitable *YTS* courses in the autumn of 1983.

75. *ITEC Centres* were being set-up and several colleges were becoming involved in their planning and development, mainly in the role of consultants to the *Manpower Services Commission*. It seemed likely that there would be rapid development in this field in the near future.

12 LIAISON WITH LOCAL INDUSTRY.

76. Liaison with local industry was generally good and all colleges tried to develop this side of their work by providing short courses on demand. Most wanted local firms to approach them, but one actively sought opportunities to run such courses, having two Industrial Liaison Officers (who were Principal Lecturers) to visit local firms and organize the work. As a result about 250 such courses per year were run by this college, some on the firms' premises, attended by about 3000 students per annum. The income derived from this work had enabled the college to make noteworthy development in IT.

77. ***Appendix C*** includes a short list of typical courses which colleges offer for industry.

13 THE EFFECT OF THE INTRODUCTION OF INFORMATION TECHNOLOGY ON THE DESIGN OF 'MAINSTREAM' CURRICULA.

78. IT did not appear to have made a substantial impact as yet on 'mainstream' courses offered by colleges, although the Examining Boards, *BEC* and *TEC*, and the professional institutions were in the process of introducing some IT related modules into their syllabuses and course programmes. There did not yet appear to be any general realisation by these bodies that the whole approach to the FE curriculum needed to be reappraised in the light of recent technological change and developments in IT.

79. There was a general feeling in the colleges that *BEC* and *TEC** were late in introducing IT into courses and slow to respond to college initiatives in this area. Current *BEC* modules were thought to be old fashioned. For example, the option module 'Elements of Data Processing', apparently in widespread use, referred to punched card and other equipment which is now out of date. It must, however, be said that both bodies have tried to adopt a flexible attitude to the validation of programmes which have introduced IT, and new modules and units reflecting current developments have recently been issued or are now in the course of preparation.

80. The professional institutions such as the *Institute of Bankers* and the *Institute of Chartered Accountants* were also said to be slow to accept the implications of IT for their course syllabuses.

81. Individual colleges appeared to do what they could, as for example at one college where machine accounting had been superseded by computerised accounting on microcomputers, but it is apparent that there is a need for a clear lead from all the bodies concerned. It is only fair to add that there was one exception – the *Associated Examining Board* was highly regarded for its development of syllabuses in *Computer Science*.

82. There have evidently been some minor improvements to courses as a result of the introduction of IT. For example, engineering problems can be made more life-like since the mathematical difficulties in them, however intractable they might be in classical methods of solution, can be overcome by the computer. Techniques of instruction can also be improved by *CAL* and by the use of simulation techniques but there was no evidence of any impending revolution in syllabuses and teaching techniques.

*BTEC since October 1983

14 STAFF DEVELOPMENT.

83. Staff development was generally constrained by lack of funds and so it was often not possible to release staff for in-service training because there was no one to replace them.

84. The colleges were, however, keenly aware of the urgent need for staff development in IT, most (but not all) making some effort to provide it. One or two vigourous staff development programmes specifically related to IT, but in most the training in IT was part of a general programme of staff development and no special priority was accorded to it. Attendance on these courses was nearly always voluntary and few colleges had any rolling programme of training. In some colleges members of staff were invited to attend in service courses (usually on Wednesday afternoons) and some lecturers had made commendable efforts to improve their own expertise, often having bought their own *microcomputer*.

85. Instruction in IT was usually provided by college staff and only rarely was help obtained from outside. In one college six of the participants on an initial IT staff development course were selected to form the nucleus of an IT team. In another the Faculty of Engineering held seminars in various aspects of IT, and staff who were not teaching were expected to attend. Another college had invited LEA representatives to attend its IT management awareness seminar.

86. It is perhaps worth noting that some of the more successful staff development exercises in IT appeared to the those in which staff participated in peer group learning rather than relying upon 'expert' assistance. Release from teaching duties was generally most effective when it enabled staff to attend conferences or short courses, or make contact with firms using IT in business and industry. In one college a member of staff had been successfully seconded to industry on 'day release' to learn about *CAD*.

87. One college by involving its staff Development Officer in the college IT committee had generated in-house staff development programmes in computing, networking and the use of Prestel.

88. However, even in colleges such as these, developments in non-user and small-user departments were slow and sporadic, since few of the staff were trained in IT and it was difficult for them to start.

15 COLLEGE PLANS FOR FUTURE DEVELOPMENT.

89. All the colleges surveyed had some plans for the future but few were clearly defined and some amounted to no more than hopeful aspirations. None had plans which provided effectively for a comprehensive development of IT throughout the college.

90. Such developments can take place only if staff of all disciplines are trained in IT, and while the main user departments were progressing well the small user and non-user departments were likely to remain as they were because of the difficulty of releasing staff for inservice training.

91. Colleges are heavily dependent on support from their LEA's and in the current atmosphere of financial restraint long term planning was almost impossible.

16 SUMMARY AND CONCLUSIONS

92. On the basis of this sample survey the following generalised conclusions may be drawn:

1 *There appear to be various definitions of INFORMATION TECHNOLOGY. The definition adopted for practical purposes by colleges may differ in significant respects from others known to be current. This could be important if it confuses and delays policy making in this area. [Paras 4-7]*

2 *There is a wide variation in college IT policy and development. Few colleges appear to have an effective and structured approach to policy formulation and development in this area. As a result many departments have little awareness of IT. Inter-college co-operation is rare. [Paras 8-17]*

3 *LEA support for, and control of, college IT development varies. In particular, the variations of LEA policy regarding the retention of fee-income by the colleges appears to be a significant determinant of development. [Paras 18-22]*

4 *Some colleges have been assisted by Government initiatives, mainly by the DOI. The MEP programme has not resulted in any significant aid to FE colleges. [Paras 23-27]*

5 *The possession of MAINFRAME computers is no longer a major aspiration of colleges. MICROCOMPUTERS, WORDPROCESSORS, CNC MACHINES and ROBOTIC ARMS are now widely used. [Paras 28-33]*

6 *The staffing of IT work in the colleges is diversified: Computer Studies are generally associated with a specific department; specific applications are staffed by individual departments. The co-ordination of such staff across the college is variable and often informal. The availability and training of support staff obviously poses problems for future development. [Paras 34-46]*

7 *Few colleges have purpose built computer accommodation. The increasing use of mobile micro-devices results in an uncertain picture as to the nature of accommodation now required. [Paras 47-50]*

8 *The development of software is usually due to the work of enthusiastic staff. Many are working in isolation and some form of co-ordination is clearly needed. [Paras 51-53]*

9 *College departments most involved in IT are Engineering, Science, Business and Office Studies and, to a lesser extent, Catering. Most other departments have little or no awareness of what is required. College administration and library automation are non-academic uses of IT. [Paras 54-69]*

10 *Links with schools in this area are tenuous. Some colleges provide in-service training, others are involved in link-courses, few provide a schools computing service. [Paras 70-72]*

11 *COMPUTER LITERACY FOR YTS and similar schemes, is a growing curricular provision. The inclusion of IT in 'mainstream' FE curricula is however, proceeding slowly and unevenly. [Paras 73-82]*

12 *Staff development in IT varies between colleges. Many good practices can be identified alongside much neglect. [Paras 83-88]*

13 *Positive long-term college policies in this area are difficult to identify, mainly due to the uncertain financial situation. [Paras 89-91]*

Appendix A. Methodology of the survey.

1. A sample of 20 colleges was chosen from those known to be actively engaged in developing their expertise and resources in IT. As far as possible the colleges selected were representative of the whole range of NAFE colleges in size and they were fairly evenly distributed throughout England and Wales.

2. The researcher visited the colleges usually spending two or three days in each. After an initial discussion with senior members of staff of the college a visit was made to each department and a discussion held with departmental staff concerning the present state of development in IT. An aide-memoire was used to ensure that the survey was similarly conducted in each college and each visit was usually concluded with a final discussion with the Vice-Principal.

3. In some colleges examples of good practice or of unusual applications of IT were noted and a return visit was made to these to make a more detailed investigation.

4. The matters on which information was sought included:

Statistical details

Policy relating to the development of IT

Existing state of IT

- *Organization*
- *Staffing*
- *Resources*

State of IT in each department

Staff development

Schools computing service

IT for the unemployed

Liaison with industry

Effect of the introduction of IT on the design of the curriculum

Plans for future development

Examples of good practice or unusual applications of IT

Statistical details of the colleges visited are given in the table below.

COLLEGE	No OF STUDENTS		No OF DEPTS	PERCENTAGE NON-ADVANCED WORK	No OF SITES
	FULL-TIME	PART-TIME			
A	1,350	3,000	8	90	2
B	1,750	7,000	9	77	10
C	1,400	7,500	9	83	10
D	2,500	8,500	6	90	7
E	2,000	7,500	8	90	4
F	2,500	4,500	6	85	4
G	1,200	10,500	10	77	4
H	630	2,000	4	95	6
J	1,600	4,000	7	93	4
K	500	3,000	3	60	1
L	1,000	6,000	8	95	6
M	2,500	8,500	10	80	2
N	3,100	5,000	10	90	14
P	2,500	10,000	13	72	4
Q	1,800	5,000	7	86	3
R	500	3,500	3	95	1
S	1,650	5,000	10	75	4
T	2,100	15,000	11	99	11
U	350	750	4	90	2
V	750	1,700	4	95	3

Appendix B. Usage of IT by college departments.

The table below shows the use of IT by college departments – which are shown in the following groups.

Group 1 *Mechanical Engineering*
Electrical Engineering
Engineering
Engineering and Science
Technology
Metallurgy
Electrical Craft
Automobile Engineering
Maritime Studies

Group 2 *Accounting Studies*
Office Studies
Management Studies
Professional Administration

Group 3 *Science*
Mathematics/Computing

Group 4 *Construction*
Building Crafts

Group 5 *Adult Education*
Continuing Education
General Studies
Liberal Studies

Group 6 *Catering*
Food Trades

Group 7 *Home and Fashion*
Health and Community

Group 8 *Art/Design*
Architecture
Photography

Group 9 *Agriculture*

Group 10 *Vocational Preparation*

Use of IT is represented by the symbol ● and non use of IT by the symbol □

COLLEGE	DEPARTMENTS (BY GROUPS)										TOTAL DEPART-MENTS
	1	2	3	4	5	6	7	8	9	10	
A	● ●	● ●	●	●	□	□					8
B	● ●	● ● ●	● ●	●				□			9
C	● ●	● ●	●	□	□ □	●					9
D	●	●	●	□		□		□			6
E	● ●	●	●	□	□	●	□				8
F	●	●	●	□	□			□			6
G	● ●	● ● ●		□	● □		□	●			10
H	●	●			□ □						4
J	●	●	●	●	□	●		●			7
K	●	●	●								3
L	● ●	●	●	●	□	□				●	8
M	● ●	● ●	●	●	● ●	●	□				10
N	□ ● ●	●	●	●	□	●	□			●	10
P	● ●	● ● ●	●	●	●	●	□	● ●		●	13
Q	● ● □		●	● □	□						7
R	●	●				□					3
S	● ● ●	● ● □ □			●	□		●			10
T	● ● ●	●	●	●	●	●	●	□		●	11
U	●	●	●						●		4
V	●	●	●			□					4
TOTAL ●	34	29	17	9	6	7	1	5	1	4	113
TOTAL □	2	2	0	6	12	6	5	4	0	0	37
GRAND TOTALS	36	31	17	15	18	13	6	9	1	4	150

Appendix C. Typical courses in information technology.

GCE O level Computer Science
GCE A level Computer Science
Computer Studies 2 year pre-University course
CGLI 746 and 747 courses in computer programming
Microprocessing and computing for OND Sciences

Standard modules in computing for TEC courses at levels I, II and III
Computer technology including robotics. CGLI 756
Computerized numerical control of machine tools CGLI 220/2/11

Standard modules for BEC courses
Word processing courses for secretaries
Course for accounting technicians

Computer appreciation course for TEC Diploma in Hotel Catering and Institutional Operations
Computer appreciation for Hotel Receptionists. CGLI 709

TOPS course for computer operators
NCC threshold course in computing
YTS computer literacy

Short courses:
- *Computer appreciation courses for the general public*
- *Programming courses for the general public*
- *Courses for local industry eg:*
  - *Use of microcomputer systems for small engineering companies*
  - *Introduction to PASCAL*
  - *Microprocessor appreciation for managers*
  - *An introduction for microprocessors*
  - *16-bit microprocessor systems (Hardware)*
  - *An introduction to industrial robot systems*
  - *Installation and use of industrial robots*

Appendix D. Examples of good practice.

1 BUILDING

IT APPLICATION: Calculations of various parameters in the design of domestic central heating installations.

METHOD: Five programs were written by a member of the college staff and they are used to calculate:

(i) the heat loss in a room;
(ii) radiator and pipe sizes for a one-pipe central heating system;
(iii) radiator and pipe sizes for a two-pipe central heating system;
(iv) duct and register sizes for a warm-air central heating system;
(v) size of pipes used in a gravity fed primary circuit.

There are also two sub-routines used to calculate pipe sizes and loss of hydrostatic head in various parts of the installation.

COURSES TAUGHT: These programs are run on a small microcomputer and are used on a course called *'Programming for Heating Engineers'*, which is run as an evening course, 2 hours per week for 35 weeks. Students are taught the elements of programming in *BASIC* and applications to the design of central heating installations.

2 ART AND DESIGN

IT APPLICATION: Computer typesetting using the Varityper Comp/set system.

METHOD: This method of typesetting supersedes other methods which use metal type. A varityper is used to produce a small diskette on which the material to be printed and details of the job are impressed electronically. The machine also incorporates a fount disc which contains all the various styles of type which can be used. The diskette operates a light which flashes through an aperture when the required character on the fount disc passes in front of it and the light falls on to photographic paper and so prints the character. When all the characters have been printed in this way the photographic paper is developed and a print is obtained.

COURSES TAUGHT: This technique is taught to 2nd Year students on the *DATEC Diploma course in Graphic Information.*

COST: Cost of equipment: about £7,000.

3 MECHANICAL AND PRODUCTION ENGINEERING

IT APPLICATION: Computer aided draughting. A commercial Robographic system is used to teach computerized technical drawing.

METHOD: The equipment consists of a small microcomputer, a visual display unit, a printer and a device called a bitstick. The bitstick consists of a lever mounted on a segment of a sphere and can be moved in any direction in the horizontal plane, and it looks somewhat like the joystick on an aircraft.

When the appropriate program is loaded into the computer lines can be drawn on the VDU screen by moving the bitstick. A 'menu' of various facilities available is displayed on the screen – and any one of these can be selected, so that for example the operator can either draw freehand, or call up coordinates and so make an accurate scale drawing, or enlarge a part of his drawing or reproduce it elsewhere on the screen, or alter the scale of the drawing etc. Any drawing can be reproduced on the printer. Drawings can be saved and held on disc to be recalled for use at a later date.

COURSES TAUGHT: This technique is taught to full time students at *Level II TEC Certificate in Engineering* and to part time students at *Level III.*

COST: Cost: £4,000 (approximate).

4 LIBRARY

IT APPLICATION: The college library has about 37,000 books and takes about 170 periodicals regularly. There are about 4,200 book borrowers among the students and staff. In 1982 a microcomputer system was purchased to provide cataloguing and book circulation control facilities.

METHOD: The system keeps a catalogue of books and periodicals in the library, recording for each the author, title, Dewey classification number, International Standard Book Number (ISBN), accession number, and an abbreviated publisher statement. This single record is similar to the usual catalogue card, but it can be retrieved by reference to any of the attributes (or 'fields') listed above, except the publisher statement. This is similar to, but more flexible than the usual card catalogue system in which cards have to be prepared in triplicate so that they can be filed in author, title and class number order. In addition, the system creates an accession file in which each item is identified by its accession number. Other features include the ability to retrieve a title by reference to individual words in the title, and to identify books by reference to their ISBN's. Additions, deletions and amendments can be easily made.

The system also provides an on line computerized control of the issue and return of books – the entries into the computer terminal being the book accession number and the borrower number. Overdue notices are produced automatically and since the introduction of the system, the number of overdue books has dropped noticeably. At present, the system has three visual display units and it is proposed to buy two more in 1984.

COST: The total cost of the system will then be about £7,000.

5 VOCATIONAL PREPARATION UNIT

IT APPLICATION: Microcomputers for students under the NTI scheme.

METHOD:
COURSES TAUGHT: There are seven work stations in the classroom, networked to a 10mB hard disc. It is proposed to install a further 10 work stations. The system is flexible and versatile and is currently used by about 370 students for 7-13 weeks; there are about 130 students in training at any one time. It is used to train three categories of student. Those with administrative ability are taught administrative and clerical procedures, typing and word processing and some computer programming. Those with technical skills are taught how to use a microcomputer to list items, to record deliveries, rejects, etc. and how to produce information files. Low achievers and slow learners are given simple programs to help them improve their spelling and reading and their dexterity is assessed by means of keyboard tests.

6 CATERING

IT APPLICATION: The Catering Department has installed two separate microcomputer systems: one for use in 'front office' situations and the other to provide a catering information system.

METHOD: The 'front office' system will provide students with simulated situations such as hotel room reservations, room occupancy rates, billing, stock control etc. The Catering information system is a real time system used to run the Department's own catering activities including the college restaurants, menu stock control and control of stores generally.

COURSES TAUGHT: About 140 full time and 50 part time students use the 'front of house' installation and all students, about 235 full time and 130 part time operate the catering information system.

COST: The total cost of both systems was about £17,000.

7 ELECTRICAL ENGINEERING

IT APPLICATION: Distance Learning Package Microelectronic Systems I.

METHOD: The package consists of a microcomputer with built-in keyboard and display and input and output board, a text book and study and practical guides.

COURSES TAUGHT: A learning package is available for students who wish to study microelectronics but are unable to attend college regularly. It is designed for those with no previous experience of microelectronics and has been written to satisfy the requirements of the *BTEC Microelectronics System I Unit*. The course lasts about 14 weeks requiring 3-5 hours study per week at home and an occasional visit to the college.

COST: The cost of the complete package (including the microprocessor) is £145 of the cost of the written material with hire of the microprocessor and associated equipment is £58.

8 BUSINESS STUDIES AND ADMINISTRATION

IT APPLICATION: Use of microcomputers to teach data processing and word processing.

METHOD: At the beginning of the academic year 1981-82 the department installed 8 microcomputers which superseded the electrical accounting machines previously in use for teaching purposes, and this number was later increased to 16. They are grouped in two clusters of 8, one being used for data processing and the other for word processing, but this division is not rigid and machines can be used for either purpose as occasion demands. There is in addition a machine for staff use and another with a large TV monitor is used for demonstration purposes. Each machine is entirely self-contained and has its own printer. Each student has the use of a microcomputer and printer, and works independently at his own pace, supervised and encouraged by the staff and loading the programs required into this machine himself.

COURSES TAUGHT: This department teaches elementary data processing to students taking *BEC General* and *BEC National* courses and word processing to those taking courses in office skills.

All those students studying for BEC National examinations follow an integrated syllabus of numeracy, accounting and data processing which was prepared by the College and approved by BEC. Students taking the BEC General course are taught the standard data processing module, but in addition they learn the elements of accounting, control of data and proof of accuracy.

Those following courses in office skills use an accounting package to study elementary bookkeeping and they also learn word processing, the aim being to give them 20 hours keyboard experience in their course. At present there is no externally validated examination scheme for these students but it is hoped that the RSA will shortly approve a scheme of work devised by the College.

COST: Cost: about £2,000 per work station.

9 COLLEGE ADMINISTRATION

IT APPLICATION: Automated system of College Administration

METHOD: Two large microcomputers, a word processor and a varityper have been purchased and used to process most to the work related to the following aspects of college administration:

a) **Financial management:**

(i) commitment accounting (eg control of capital revenue, petty cash, teachers' claims etc);
(ii) unit costing – staffing ratios etc;
(iii) staff salary tables.

b) **Examination procedures:**

The system

(i) accepts the initial entry of a candidate;
(ii) analyses the entry to determine the fee to be paid;
(iii) prints entries to examination boards;
(iv) validates the entries;
(v) prepares examination room allocation;
(vi) produces timetable of examinations;
(vii) produces letter to candidate with personal timetable;
(viii) produces attendance register;
(ix) analyses results by subject, Department and examination board;
(x) analyses all financial aspects of the examinations;
(xi) identifies clashes;
(xii) identifies candidates with special needs;
(xiii) rejects false entries.

c) **In addition the following aspects of automated administration are being actively developed and some are already in use:**

(i) Enrolments;
(ii) FESR;
(iii) Production of class registers – it is intended that attendances will be counted automatically by an optical character reader;
(iv) Analysis of classes by grades of teaching;
(v) Production of detailed student academic profile for each student;
(vi) Timetabling of accommodation;
(vii) Staff timetables;
(viii) Report of absence of part-time students to their employers;
(ix) Control of resources;
(x) Administration of BEC/TEC examination entries.

d) **Internal Printing**

The word processor and the varityper produce all the stationery needed for the above procedures. In addition a prospectus is designed and printed for each Department.

Appendix E. Glossary.

BEC	*Business Education Council (Now BTEC)*
BTEC	*Business and Technician Education Council (since 1 October 1983)*
CAD	*Computer Aided Design*
CAL	*Computer Assisted Learning*
CGLI	*City and Guilds of London Institute*
CNC	*Computerised Numerical Control*
DATEC	*Design and Art in the Technician Education Council*
DOI	*Department of Industry*
FE	*Further Education*
FESR	*Further Education Statistical Returns*
FEU	*Further Education Unit*
HOD	*Head of Department*
IT	*Information Technology*
ITEC	*Information Technology Education Centre*
LEA	*Local Education Authority*
MAP	*Microprocessor Applications Project*
MEP	*Microelectronics Education Programme*
MSC	*Manpower Services Commission*
NAFE	*Non-Advanced Further Education*
NCC	*National Computing Centre*
NTI	*New Training Initiative*
OND	*Ordinary National Diploma*
PASCAL	*A computer programming language*
RSA	*Royal Society of Arts*
TEC	*Technician Education Council (Now BTEC)*
TOPS	*Training Opportunities Scheme*
UNESCO	*United Nations Educational Scientific and Cultural Organisation*
VDU	*Visual Display Unit*
YTS	*Youth Training Service*

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J F Mann
Schools Council

P C Webb HMI
Welsh Office Education Department

SECRETARY
Jack Mansell
Chief Officer, Further Education Unit

Objectives

The objects for which **The Further Education Unit (FEU)** is established are to promote, encourage and develop the efficient provision of further education in the United Kingdom and for that purpose:

(a) to review and evaluate the range of existing further education curricula and programmes and to identify overlap, duplication, deficiencies and inconsistencies therein;

(b) to determine priorities for action to improve the provision of further education and to make recommendations as to how such improvement can be effected;

(c) to carry out studies in further education and to support investigations of and experimentation in, and the development of further education curricula and to contribute to and assist in the evaluation of initiatives in further education;

(d) to disseminate and publish information and to assist in the dissemination and publication of information about recommendations for and experiments and developments in further education.

The publications in this series of *Reports* are intended to inform teachers and others and to stimulate professional discussion about matters of concern to the FE service. The views expressed are not necessarily those of the Unit's Board of Management.

About this publication

With the microprocessor and its associated technology already impinging upon all aspects of society, **Information Technology** is now recognised as a major growth area in education and training. This publication reports the key findings of a survey of twenty colleges actively engaged in developing their IT expertise and resources.
Its findings show that many teachers do not appreciate the relevance of the computer to their work, and reveal that few colleges have an effective and structured approach to IT in terms of staffing, equipment or application. The lack of relevant software emerges as a significant practical constraint on IT development in the colleges. The report highlights various factors which need urgent attention if IT is to be tackled effectively by the FE sector (an area in which the FEU is actively in support) as well as outlining the usage of IT by departments, and the typical courses available. Additionally, it includes a number of case studies of IT development and application successfully achieved by individual departments, demonstrating how a considerable amount can be done with limited resources.
The scope of the report allows it to do no more than point to what has to be done in this crucial area. However, its publication will be more than justified if it motivates individual colleges to begin **now** the task of getting to grips with the rapid expansion of IT, and thus meet the requirements and needs of FE's changing clientele in particular – and those of a changing society in general.

Other occasional papers available

COMPUTER LITERACY

Part 1: A manager's guide

Jo Lloyd, James Taylor, Chris West
Gloucester College of Arts and Technology

'The ability – or lack of it – in using a micro-computer will, for the next two decades at least, identify our age-group and/or our talent for keeping up to date.' This two-volume report aims to assist the FE system to understand the concept of computer literacy defined in terms we can all comprehend, and to make it an essential, flexible part of FE provision available to all. **Part 1** caters for the providers of computer literacy courses – those engaged in management functions – for whom it gives an overview of computer literacy in the context of education and training schemes, staff development and resource allocation.
(November 1983).

TOWARDS THE ELECTRONIC OFFICE

Christine Disney, *Computer Consultant*

A timely overview of the curricular implications of new technology for business education and training. The early sections of the report describe a growing awareness and use of information technology by industry and commerce. The later sections look at the ways in which the training and education systems are reacting to a rapidly changing situation.
(September 1983).

COMPUTER AIDED DESIGN IN FE

Some suggestions on the inclusion of CAD topics in Mechanical Engineering courses.

Peter Ingham
City of Birmingham Polytechnic

This document is intended to give guidance to those concerned with the introduction of Computer Aided Design (CAD) into technical curricula. Whilst specially related to mechanical engineering, it should also prove useful to those in other disciplines. The author considers as inevitable the widespread adoption of CAD by British industry. Further education will, therefore, have an obvious role to play in CAD development, if it is to remain a significant contributor to technological updating. *(November 1982).*

COMPUTER AIDED PROFILING

A case study at the North Warwickshire College of Technology and Art

A description of how North Warwickshire College approached the computerisation of student profiles for a full-time vocational preparation course. The report outlines the background against which the computerisation idea evolved, the design of the profile, its computerisation, the means by which the idea has begun to be further disseminated throughout the college, the implementation of the profile on one course and the lessons which have been learned as a result. Appendix 1 of the document presents the computer specification. *(September 1983).*

To obtain FEU publications

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Middlesex HA7 1AZ.**